

(19) World Intellectual Property Organization
International Bureau



10/089177

(43) International Publication Date
5 April 2001 (05.04.2001)

PCT

(10) International Publication Number
WO 01/023604 A3

(51) International Patent Classification⁷: C12Q 1/68,
C07K 14/00, C12N 15/63, 5/10

(21) International Application Number: PCT/CA00/01150

(22) International Filing Date:
28 September 2000 (28.09.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2,283,458 28 September 1999 (28.09.1999) CA
2,307,010 19 May 2000 (19.05.2000) CA

(71) Applicant (for all designated States except US): **INFECTIO DIAGNOSTIC (I.D.I.) INC.** [CA/CA]; 2050 René-Lévesque Blvd., West, 4th Floor, Sainte-Foy, Quebec G1V 2K8 (CA).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BERGERON, Michel, G.** [CA/CA]; 1145 des Érables, Quebec, Quebec G2K 1T8 (CA). **BOISSINOT, Maurice** [CA/CA]; 109

Jean Bruchési, St-Augustin-de-Desmaures, Quebec G3A 2N2 (CA). **HULETSKY, Ann** [CA/CA]; 1231 des Pins Avenue, Sillery, Quebec G1S 4J3 (CA). **MÉNARD, Christian** [CA/CA]; 1174 du Pont, St-Lambert-de-Lévis, Quebec G0S 2W0 (CA). **OUELLETTE, Marc** [CA/CA]; 1035 de Ploermel, Sillery, Quebec G1S 3S1 (CA). **PI-CARD, François, J.** [CA/CA]; 1245 de la Sapinière, Cap-Rouge, Quebec G1Y 1A1 (CA). **ROY, Paul, H.** [US/CA]; 28 Charles Garnier, Loretteville, Quebec G2A 2X8 (CA).

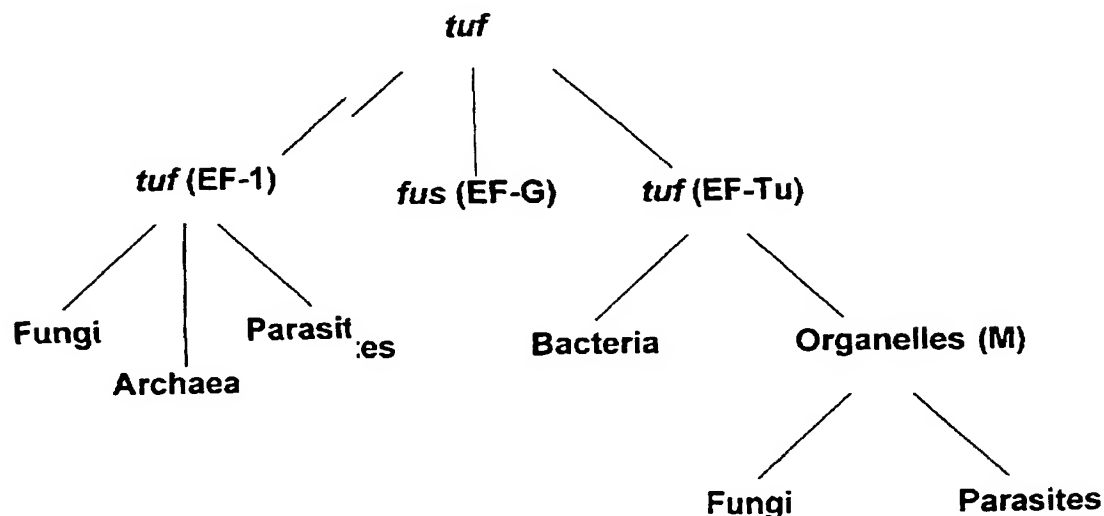
(74) Agents: **DUBUC, Jean, H.** et al.; Goudreau Gage Dubuc, The Stock Exchange Tower, 800 Place Victoria, Suite 3400, P.O. Box 242, Montreal, Quebec H4Z 1E9 (CA).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

[Continued on next page]

(54) Title: HIGHLY CONSERVED GENES AND THEIR USE TO GENERATE PROBES AND PRIMERS FOR DETECTION OF MICROORGANISMS



(57) Abstract: Four highly conserved genes, encoding translation elongation factor Tu, translation elongation factor G, the catalytic subunit of proton-translocating ATPase and the RecA recombinase, are used to generate a sequence repertory or bank and species-specific, genus-specific, family-specific, group-specific and universal nucleic acid probes and amplification primers to rapidly detect and identify algal, archaeal, bacterial, fungal and parasitical microorganisms from specimens for diagnosis. The detection of associated antimicrobial agents resistance and toxin genes are also under the scope of the present invention.

WO 01/023604 A3



patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(88) Date of publication of the international search report:

8 August 2002

(15) Information about Correction:

Previous Correction:

see PCT Gazette No. 23/2002 of 6 June 2002, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 00/01150

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C12Q1/68 C07K14/00 C12N15/63 C12N05/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, SEQUENCE SEARCH, EMBL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 24059 A (MASSACHUSETTS INST TECHNOLOGY ;AIRD WILLIAM C (US); EDELBERG JAY M) 20 May 1999 (1999-05-20) page 26, line 12	24
X	WO 98 20157 A (BERGERON MICHEL G ;INFECTIO DIAGNOSTIC INC (CA); PICARD FRANCOIS J) 14 May 1998 (1998-05-14) the whole document	24

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *g* document member of the same patent family

Date of the actual completion of the international search

17 January 2002

Date of mailing of the international search report

12 04 2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

REUTER, U

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA 00/01150

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

B x II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-44 (all partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

The present application relates to nucleic acids that can be used in the detection of microorganisms, the provision and use of said nucleic acids and products that are derived from the nucleic acids.

In view of the extraordinary amount of combinations of sequences in the claims, which render the regrouping of sequences almost impossible, in view of the large number of sequences claimed, and in view of the wording of the claims presently on file, which render it difficult, if not impossible, to determine the matter for which protection is sought, the present application fails to comply with the clarity and conciseness requirements of Article 6 PCT (see also Rule 6.1(a) PCT) to such an extent that a meaningful search for the claims as they stand is impossible.

Additionally, present claims 1-44 relate to an extremely large number of possible compositions, nucleic acids, and combinations of nucleic acids. Present claims 4, 5, 8-10, 22-31, 33-43 relate to products defined by reference to a desirable characteristic or property, namely being obtainable by a method or being capable of hybridizing to a certain nucleic acid.

The claims cover all products having this characteristic or property, whereas the application provides support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT for only a very limited number of such products. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 6 PCT): An attempt is made to define the products by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible.

Notwithstanding the aforementioned, a search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely nucleic acid sequence Seq. ID. No. 543 (see non-unity ISA form 206), methods relating to said sequence, the use of the sequence and the products derived from or defined by the sequence.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-44 (all partially)

Invention 1:

Nucleic acid molecule with Sequence ID No 543, methods for the provision of the nucleic acid, methods using the nucleic acid, use of the nucleic acid, compositions and sets containing the nucleic acid, and products derived from or defined by the nucleic acid.

2. Claims: 1-44 (all partially)

Invention 2-2297:

Nucleic acid molecule with Sequence ID No n, wherein n is chosen among 1-543 and 545-2297, methods for the provision of the nucleic acid, methods using the nucleic acid, use of the nucleic acid, compositions and sets containing the nucleic acid, and products derived from or defined by the nucleic acid.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 00/01150

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9924059	A	20-05-1999	AU 1454199 A WO 9924059 A1	31-05-1999 20-05-1999
WO 9820157	A	14-05-1998	US 5994066 A AU 731850 B2 AU 4859897 A BR 9713494 A WO 9820157 A2 CN 1248295 A EP 0943009 A2 JP 2001504330 T NO 991976 A	30-11-1999 05-04-2001 29-05-1998 29-02-2000 14-05-1998 22-03-2000 22-09-1999 03-04-2001 02-07-1999